Space Weather Forecast

Issued on Thursday, 02 March 2023 at 12:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Likelihood of Moderate flares, with slight chance of Strong activity. Increasing risk of G1/Minor Storms through the period.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Low, with the largest flare peaking at 02/0450 UTC from a region in the northwest. This is the largest and most complex region on the disc, with some magnetic complexity. Other regions currently appear small and simple, although there are three near the east limb which are still difficult to analyse due to foreshortening effects and these may be more complex than their current classification. A flare from the southwest at around 01/1330UTC appears to be the source of a Coronal Mass Ejection (CME) which may give a glancing blow at Earth overnight from 04-05 March, but is much more likely to miss.

Solar Wind / Geomagnetic Activity: Solar wind speeds have shown waning coronal hole fast wind effects. Wind speed eased from around 600 km/s to near 500 km/s. Total Interplanetary Magnetic Field has been weak, with the north-south component varying weakly. Geomagnetic activity has been Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles is at background levels, with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is expected with a slight chance of Strong activity, mainly from the large and complex region in the northwest quadrant.

Solar Wind / Geomagnetic Activity: No CMEs are forecast, but there is a very low risk of a glancing blow at Earth overnight from 04-05 March. The coronal hole fast wind is currently weakening and effects should continue to ease through Day 1 (02 Mar). Further fast wind effects are possible from Day 2, becoming increasingly likely later in the period. There is some uncertainty in the forecast, but wind speeds are likely to be at elevated or slightly elevated levels through much of this period, perhaps becoming strong on Day 4 (05 Mar).
Geomagnetic activity is expected to be mainly Quiet through Day 1, perhaps reaching Unsettled to Active levels through Day 2 (03 Mar), and then with an increasing risk of G1/Minor Storm intervals through Days 3 and 4.

Energetic Particles / Solar Radiation: The count rate of energetic protons is at background levels with a slight chance of further enhancements. These are most likely to be due to any flares from the large sunspot in the northwest.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	5	10	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	15	15	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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